# Culdoscopy

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*SUMMARY*

*Cul-de-sac puncture for introduction of a culdoscope is easily made with the patient in the knee-chest position. With the use of the instrument, the pelvic organs can be viewed clearly. Culdoscopic examination of 45 patients was carried out. In all cases in which laparotomy was done after the examination, the culdoscopic observations and diagnosis were confirmed. In no case in which tubal pregnancy was present, was the diagnosis missed in culdoscopic examination. Patients were only slightly uncomfortable after the examination. There was no evidence of pelvic peritonitis in any patient, and no pregnant patient aborted as a result of the procedure.*

THE culdoscope is an endoscopic instrument for visualization of the female pelvis through the cul-de-sac. It was designed by Decker and Cherry[1] when attempts to visualize the pelvis through the peritoneoscope were unsatisfactory because of intervening bowel and difficulty in isolating the pelvic organs. A special trocar and cannula are necessary to perforate the cul-de-sac for introduction of the culdoscope. The importance of performing the procedure in the knee-chest position to utilize the negative pressure produced to draw air into the abdomen and thus push the bowel out of the pelvis has been repeatedly stressed by Decker,[1, 2] and it is this contribution which makes the examination possible. Several articles have appeared in the literature[1,2,3,4] reporting considerable experience with the instrument and universal agreement that it is valuable in the diagnosis of pelvic disease. No serious complication following the use of the culdoscope has been reported.

Situations in which culdoscopy has proven useful have been listed by several investigators.[1, 2, 3, 4] The procedure has been of value in the diagnosis of tubal pregnancy with or without rupture, in differentiation of acute salpingitis from acute appendicitis, in the diagnosis of endometriosis, chronic salpingitis, and pelvic tuberculosis, and in the study of the tubes and ovaries in cases of infertility. Benign ovarian cysts have been differentiated from malignant neoplasms. The ovaries have been studied in cases in which there was bleeding without apparent organic cause, and in cases of postmenopausal bleeding when examination of material removed by curettement did not satisfactorily explain the bleeding and a non-palpable ovarian neoplasm was considered possible. In some cases in which a diagnosis of functional disease might have been considered on the basis of the atypical nature of pain in the lower abdomen and the absence of evidence of organic cause so far as could be determined by bimanual pelvic examination, minimal chronic salpingitis or early endometriosis was diagnosed culdoscopically. In general the procedure has proven useful in any situation in which it is desirable to know exactly the anatomical appearance of the ovaries, tubes, uterus, and other pelvic structures without resorting to laparotomy.

Contraindications mentioned are the presence of a fixed mass in the cul-de-sac, senile contracture of the vagina, acute vaginitis, and severe debilitating disease which makes it impossible for the patient to assume the knee-chest position.

During the period from September 1949 to June 1950, 47 patients were culdoscopically examined on the clinic service at Stanford University Hospital. In two cases the culdoscope could not be introduced into the cul-de-sac. In one of these cases the cul-de-sac was obscured by adhesions which had followed an appendectomy and bilateral salpingectomy done when the patient was 14 years of age for "ruptured appendix" and "immature tubes." In the other case the patient had a 10 cm. intraligamentary myoma on one side which caused minimal distortion of the cul-de-sac. In 45 cases the culdoscope was introduced into the pelvis without difficulty. Twelve (27 per cent) of the patients had had previous pelvic operation, either appendectomy or adnexal excision. No patient who had had subtotal or total hysterectomy was examined culdoscopically. Most of the patients examined were selected for the procedure because of suspicion of tubal pregnancy with or without rupture, endometriosis, myomata of the uterus, or chronic salpingitis. In a number of cases the culdoscopy was done as a preliminary procedure in patients scheduled for laparotomy the following day in order to gain experience with the instrument and to correlate the appearance of the pelvic structures through the culdoscope with their appearance at laparotomy.

## TECHNIQUE

The patients were prepared as for perineal operation. An enema was given only if there were palpable feces in the lower bowel. No special attempt was made to have the bladder empty at the time of culdoscopic examination. The patients were given 0.2 gm. of Nembutal® one and a half hours before the procedure and 20.0 mg. of Pantopon® one-half hour before. A bimanual examination was done shortly before culdoscopy to be certain that no fixed

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mass obscured the cul-de-sac. The patients were placed in the knee-chest position and assisted in maintaining that position by the attending nurse and a member of the resident staff. A supporting device was not necessary with the patient awake. Very few patients had difficulty staying in position when assisted by two helpers, although in many instances the procedure was longer than would be required for a simple diagnosis, because of the interest of several observers in viewing the pelvis through the culdoscope.

A Sims retractor was placed in the posterior vagina and held in place by an assistant. The posterior lip of the cervix was grasped with a single-toothed tenaculum and the mucosa of the posterior vaginal fornix was stretched. The posterior vault was prepared with 1:1,000 aqueous solution of Merthiolate,® and five to eight cubic centimeters of 1 per cent procaine solution was injected into the mucosa of the posterior vault in the midline 1.5 to 2 cm. from the reflection of the posterior vaginal mucosa onto the posterior lip of the cervix. A 1 cm. transverse incision was made with a scalpel through the area of the procaine wheal. The posterior vault was stretched by traction on the Sims retractor and on the cervix, which converted the incision into a rounded hole sufficient for the passage of the trocar and cannula. An attempt was made to confine this incision to the vaginal mucosa, but occasionally the posterior vaginal septum was so thin that air rushed into the pelvis when the incision was made, indicating that the peritoneum of the cul-de-sac had been pierced. The trocar and cannula were pushed through the pelvic peritoneum into the cul-de-sac. The patient usually had a transient uncomfortable sensation as the peritoneum was divided. The trocar then was withdrawn, permitting a rush of air into the abdomen, and this also caused temporary discomfort.

The distal end of the culdoscope was dipped into a warm saline solution, as was suggested by TeLinde and Rutledge,[3] to prevent fogging over from the body heat, and was then inserted through the cannula and the pelvis was inspected. Often when there was much free blood in the pelvis it was necessary to withdraw the instrument and dip it in the saline solution at intervals to keep the lens clean.

When the examination was completed the culdoscope was withdrawn and the cannula was left in place as the patient was slowly turned on her back. Pressure was put upon the abdomen in order to expel as much air as possible through the cannula, which was then removed. There was a minimal amount of bleeding from the posterior colpotomy wound, and suture of the wound was not necessary.

The examinations were done on the gynecological ward in the treatment room and not in the surgery. The patients were spared an operating room fee, and the examination could be done immediately when the occasion arose without regard for operating room schedules. Medical personnel did not wear caps, masks, or gowns. All patients were hospitalized overnight following the procedure, and the majority were dismissed ambulatory within 24 hours.

Among the patients examined culdoscopically were 11 with severe unilateral pelvic pain and an abnormal menstrual history. It could not be determined by bimanual examination whether or not tubal pregnancy without rupture was presented, and the severity of the pain was such that it was considered imperative that a positive diagnosis be made quickly. Only one of these patients had tubal pregnancy. Three patients had chronic salpingitis, five had intra-uterine pregnancy, one had a normal pelvis, and one had old postoperative adhesions. It is reasonable to believe that in some of these cases continued severe pain would have led to unnecessary laparotomy. No hormonal therapy was given to the patients who were pregnant at the time of examination, and neither uterine contractions nor bleeding developed. One of the patients aborted triplets three months after the examination, and another who desired not to be pregnant aborted under suspicious circumstances 40 days after examination. The other three patients delivered normal infants at term.

A sixth pregnant patient was subjected to the procedure in order that an ovarian cyst might be inspected. Laparotomy then was done, in the sixth weeks of gestation, and the cyst, containing the corpus luteum in its wall, was excised. The patient was given progesterone orally and parenterally. There was no tendency to abort, and a normal infant was delivered at term.

Five patients were examined culdoscopically because of severe peritoneal irritation with evidence of intra-abdominal bleeding noted on bimanual examination. Three of them had tubal pregnancy with rupture of the tube. In the other two cases there was rupture of a corpus luteum with bleeding into the pelvis, brisk enough to necessitate laparotomy in one case. In the other, a clot was observed over the corpus luteum, and as no fresh bleeding was noted the patient was kept under observation for two days and then dismissed. The pelvis was normal to palpation three weeks later. Had posterior colpotomy alone been relied upon in this case, the finding of blood in the cul-de-sac would probably have led to a mistaken diagnosis of ruptured tubal pregnancy and to unnecessary laparotomy.

Nine patients had complained of progressive dysmenorrhea which seemed severe enough to suggest the possibility of early endometriosis, although no evidence of it was noted in bimanual examination. In culdoscopic examination, brownish implants in the ovaries were noted in two patients. Two had chronic salpingitis. Five had a normal pelvis.

The culdoscope was used in a variety of other conditions. In a case in which the uterus was perforated during a diagnostic curettage, it was used to determine the position of the perforation and the amount of bleeding. A small ragged laceration in the posterior fundus was observed. It had a small clot over it and there was no fresh bleeding. The patient recovered without incident. One patient

was so obese that several examiners could not make certain by palpation whether or not a pelvic tumor was present. Upon culdoscopic examination, the uterine corpus was observed to be enlarged to four or five times normal size by multiple intramural myomata. One young patient with large subserous myomata who desired to bear children was culdoscopically examined to determine whether the myomata were sufficiently pedunculated that they might be excised without damage to the corpus. The tumors were found to be arising by slender pedicles and were subsequently excised. Two patients with primary amenorrhea were examined with the culdoscope. In one the ovaries were extremely small and white with no evidence of any follicular activity. In the other both ovaries were larger than normal and contained multiple small follicle cysts. Two patients with severe pelvic pain which appeared to be on a psychosomatic basis were culdoscopically examined and no organic disease was noted. A patient with tuberculosis of the endometrium, proven by guinea pig inoculation, was examined with the culdoscope and no evidence of tubercles on the tubes or elsewhere in the pelvis was observed.

## DISCUSSION

An attempt was made in the course of this study to evaluate the usefulness of the instrument and to look for any disadvantages. A physician pondering such a procedure might wonder about the difficulty of entering the cul-de-sac; whether the pelvic organs can be clearly seen through the culdoscope; whether puncture of the cul-de-sac through the vagina will introduce infection into the pelvis; whether the postoperative abdominal discomfort following spontaneous pneumoperitoneum can be well controlled; and whether the examination, involving as it does traction on and manipulation of the cervix, will promote abortion in pregnant patients.

As was previously noted, the cul-de-sac was entered on 45 out of 47 attempts. In three patients who, upon examination, were observed to have chronic pelvic inflammatory disease, there was increased thickness and increased vascularity of the posterior vaginal septum. In those cases, introduction of the trocar into the cul-de-sac was more difficult than usual and an increased although not alarming amount of postoperative bleeding was observed.

The pelvic structures were clearly seen through the culdoscope. The uterine corpus and the ovaries were readily visualized and could be studied in minute detail. The tubes tend to hang over the broad ligament, and often pressure in the lower quadrants applied by the culdoscopist or an assistant was necessary to bring the full length of the tubes into view. In only two cases in the series was the appendix seen.

In 27 of the 47 cases, only culdoscopy was done. In five cases dilatation and curettage were carried out after the examination, and in 15 cases laparotomy. Of the 32 patients who did not have laparotomy, only one had febrile response. The patient, who had numerous psychosomatic complaints, refused to drink water after the procedure, and the temperature rose to 38.8° C. the evening after the examination and again the next day. There were no localizing signs or symptoms. The patient was given antibiotics, and the temperature returned to normal on the second day. None of the 31 afebrile patients was given antibiotics. Of the 15 patients who had laparotomy after culdoscopic examination, ten had fever postoperatively. One had urinary tract infection which responded to therapy with sulfa drugs. Four patients had chronic pelvic inflammatory disease and were given penicillin daily. Four patients were given no antibiotics. In none of these cases did the temperature elevation last beyond the second postoperative day. In the tenth patient a massive broad ligament hematoma developed after salpingectomy for ruptured tubal pregnancy. The temperature spiked to 38° C. daily. It was not affected by antibiotics and was still present on the 15th postoperative day. Two months after operation the pelvis was normal to palpation. In none of the 47 cases did the culdoscopic procedure introduce infection into the pelvis, nor was the postoperative course of patients who had abdominal operations affected by the preoperative culdoscopic examination.

Postoperative discomfort from pneumoperitoneum was minimal in most instances, and shoulder pain, when it occurred, was lessened to a great extent by having the patient again assume the knee-chest position, which helped to move the air out from under the diaphragm and back into the pelvis. Spontaneous pneumoperitoneum from passage of air through the posterior colpotomy wound when the patient again assumed the knee-chest position did not occur in this series. Although acetylsalicylic acid and codeine was ordered routinely for relief of postoperative discomfort in the 32 cases in which laparotomy was not done, 20 of the patients did not ask for any analgesic. For the 12 patients who did need postoperative analgesia, one or two codeine tablets sufficed.

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